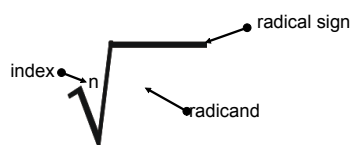


## 5.5 Roots of Real Numbers



Simplify

$$\sqrt{36} = 6 \text{ principal root}$$

Solve

$$\sqrt{x^2} = \sqrt{36}$$

$$x = \pm 6$$

$$\begin{array}{ccc} \sqrt{75} & \sqrt{24} & \sqrt{32} \\ \swarrow \quad \searrow & \swarrow \quad \searrow & \swarrow \quad \searrow \\ 25 \quad 3 & 4 \quad 6 & 8 \quad 4 \\ \swarrow \quad \searrow & & \swarrow \quad \searrow \\ 5 \sqrt{3} & 2 \sqrt{6} & 4 \sqrt{2} \end{array}$$

$$\sqrt[3]{27} = 3$$

Handwritten diagram showing the prime factorization of 27 as  $3 \times 3 \times 3$ , with a circle around the three 3s.

$$\sqrt[3]{54}$$

Handwritten diagram showing the prime factorization of 54 as  $3 \times 3 \times 3 \times 2$ , with a circle around the three 3s.

$$3\sqrt[3]{2}$$

$$\sqrt{16x^3}$$

$$4|x|\sqrt{x}$$

$$-\sqrt{9x^6}$$

$$-3x^3$$

$$\pm \sqrt{(q^3 + 5)^4}$$

$$\pm (q^3 + 5)^2$$

$$\sqrt[4]{x^8 y^{12} z^4}$$

$$= x^2 y^3 z$$

$$\sqrt[3]{-27p^6}$$

$-3p^2$

5 MATH  $\times \sqrt[5]{243}$

243

81 3

9 9

3 3 3 3

$$\sqrt[5]{243a^{10}b^3}$$

$3a^2\sqrt[5]{b^3}$

$$\sqrt{-4}$$

Not Real

$$\sqrt[3]{-8}$$

-2

$$\sqrt[6]{t^7}$$
$$t \sqrt{t}$$

HW

p248

31, 43, 49, 30-54 x3 (Multiples of 3)